

PATENT
130699 (SPLG 12553-1014)

WHAT IS CLAIMED IS:

1. (currently amended) A temperature regulator that adjusts a temperature of an X-ray detector, comprising:

a controller;

a thermal sensor reporting temperature data to the controller;

a thermo-electric device having a positive voltage contact and a negative voltage contact that responds to the controller being in receipt of the temperature data from the thermal sensor, the contacts configured to allow reversing a voltage applied thereto;

a heat dissipating plate in contact with an X-ray panel of the X-ray detector;
and

a cold plate in thermal contact with the heat dissipating plate via a heat pipe, at least one of the heat dissipating plate and cold plate connected to the thermo-electric device;
and

thermal insulation configured to thermally isolate the cold plate from electronics of the X-ray detector .

2. (original) The apparatus of claim 1, further comprising:

a switch that switches the positive voltage contact and the negative voltage contact.

3. (original) The apparatus of claim 1, wherein the thermal sensor is a thermocouple.

4. (original) The apparatus of claim 1, wherein the thermal sensor is in contact with an X-ray panel.

5. (original) The apparatus of claim 1, further comprising:

PATENT
130699 (SPLG 12553-1014)

a voltage source connected to the positive voltage contact and the negative voltage contract.

6. (original) The apparatus of claim 1, wherein the thermo-electric device is a solid state thermo-electric device.

7. (original) The apparatus of claim 1, further comprising:

a switch that controls current direction at the positive voltage contact controlled by the controller in response to receipt of temperature data.

8. (original) The apparatus of claim 1, where the thermo-electric device responds to the control to maintain an X-ray panel in the X-ray detector within a predetermined temperature range.

9. (original) The apparatus of claim 8, wherein the predetermined temperature range is twenty-five to thirty-five degrees Celsius.

10. (currently amended) A method for regulating temperature of a medical X-ray detector, the method comprising the steps of:

measuring a temperature of the medical X-ray detector;

determining if the temperature of the medical X-ray detector is within a predetermined operational range;

adjusting via a positive voltage contact and a negative voltage contact a current that enters a thermo-electric device in order to change the temperature of the medical X-ray detector; and

providing a heat dissipating plate in contact with an X-ray panel of the medical X-ray detector and in thermal contact with a cold plate via a heat pipe with heat being transferred from the heat dissipating plate to the cold plate via the heat pipe; and

PATENT
130699 (SPLG 12553-1014)

thermally isolating at least one of the heat pipe and cold plate from electronics of the X-ray detector.

11. (original) The method of claim 10, further comprising the steps of:
identifying a mode of temperature control the device requires; and
changing polarity of a voltage entering the thermo-electric device in response to the mode of temperature control.

12. (previously presented) The method of claim 11, wherein the step of changing further comprises the step of:
switching the voltage with an electromagnetic switch that responds to the controller.

13. (original) The method of claim 10, where measuring further comprise:
sending data from a thermocouple to the controller.

14. (original) The method of claim 10, wherein the thermo-electric device is a solid-state thermo-electric device.

15. (original) The method of claim 10, wherein the predetermined operating range is twenty-five to thirty-five degrees Celsius.

16. (currently amended) A system that adjusts a temperature in a X-ray detector, the system comprising:

a controller;

a thermal sensor reporting temperature data to the controller;

a thermo-electric device having a positive voltage contact and a negative voltage contact that responds to the controller being in receipt of the temperature data from the thermal sensor, the contacts configured to allow reversing a voltage applied thereto;

PATENT
130699 (SPLG 12553-1014)

an external cooling device that removes thermal energy from the thermo-electric device; and

a cold plate and a heat sink connected to the thermo-electric device, the heat sink in contact with an X-ray panel of the X-ray detector; and

at least one heat pipe thermally connecting the cold plate and the heat sink;
and

thermal insulation between electronics of the X-ray detector and at least one of the heat pipe and cold plate.

17. (original) The apparatus of claim 16, further comprising:

a switch that switches the positive voltage contact and the negative voltage contact.

18. (original) The apparatus of claim 16, wherein the thermal sensor is a thermocouple.

19. (original) The apparatus of claim 16, wherein the thermal sensor is a solid-state thermal sensor.

20. (original) The apparatus of claim 16, wherein the thermal sensor is in contact with an X-ray panel.

21. (original) The apparatus of claim 16, further comprising:

a voltage source connected to the positive voltage contact and the negative voltage contract.

22. (original) The apparatus of claim 16, wherein the thermo-electric device is a solid-state thermo-electric device.

PATENT
130699 (SPLG 12553-1014)

23. (original) The apparatus of claim 16, wherein the external cooling device is a liquid cooling device.

24. (original) The apparatus of claim 16, where the external cooling device is located more than three meters from the thermo-electrical device.